

Application No. 10/646988 (Docket: CNTR.2209)
37 CFR 1.111 Amendment dated 05/09/2006
Reply to Office Action of 02/09/2006

REMARKS/ARGUMENTS

In the Office Action, the Examiner noted that claims 1-22 are pending in the application. The Examiner additionally stated that claims 1-22 are rejected. By this amendment, claims 1, 9, and 14 have been amended. Hence, claims 1-22 are pending in the application.

Applicant hereby requests further examination and reconsideration of the application, in view of the foregoing amendments.

In the Specification

Applicant has amended the specification to secure a substantial correspondence between the claims amended herein and the remainder of the specification. No new matter is presented.

In the Claims

Rejections Under 35 U.S.C. §102(b)

The Examiner rejected claims 1-2, 6-16, and 20-22 under 35 U.S.C. 102(b) as being anticipated by Mittal et al., U.S. Patent No. 5719800 (hereinafter, Mittal). Applicant respectfully traverses the Examiner's rejections.

With reference to claim 1, the Examiner noted that Mittal teaches the apparatus including:

- a. a plurality of functional units each including a corresponding plurality of activity outputs, for indicating when a respective functional unit is enabled [figs. 1 and 51.
- b. utilization assessment logic, coupled to said plurality of activity outputs, for assessing activity thereof to determine a current total power consumption value for the microprocessor [col. 5 lines 30-42 and col. 11 lines 54-58].
- c. power control logic, coupled to said utilization assessment logic, for comparing said current total power consumption value with a threshold power value included in a specified power profile [col. 5 lines 30-42 and col. 11 lines 54-58].

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d. a power consumption controller, coupled to said power management logic and said plurality of functional units, for engaging one of a plurality of power reduction modes if said current total power consumption value exceeds said threshold power value [abstract and col. 5 lines 25-29].

Applicant respectfully disagrees with the Examiner's rejection of claim 1 for the following reasons. First, Mittal teaches a technique that allows an IC to dynamically make the tradeoff between high-speed operation and low-power operation, by throttling back performance of a function unit when its recent utilization exceeds a sustainable level. Thus, the technique allows the IC to dynamically throttle back the execution rate of maximum worst-case power consumption sequences of operations so as to not exceed the worst-case power consumption allowable, thus avoiding reliability, heat dissipation, or power supply problems. (col. 4, lines 19-28) If the activity level is greater than a threshold, then a functional unit is operated in a reduced-power mode. The threshold value is set large enough to allow short bursts of high utilization to occur without impacting performance. (Abstract) Mittal states that "the validity of these or any other premises about the best techniques for optimizing performance in the context of worst-case power conservation is preferably determined by profiling the realistic worst-case power benchmark described above. (col. 12, lines 18-22)

Clearly, Mittal teaches how to throttle performance of functional units to a level that does not exceed a worst-case power consumption value.

Applicant's invention, on the other hand, is directed toward power management of a microprocessor under more than a single circumstance. In fact, Applicant's invention is allowed to trade performance for power under certain cases. According to the present invention, more than one power profile is stored within power control logic 340. In an exemplary embodiment, power control profiles are stored in a look-up table in the power control logic 340. Each of the power profiles has a corresponding power consumption threshold. Table 5 of the specification shows 11 exemplary power profiles which may be selected from for power management.

Accordingly, claim 1 recites, in combination with other elements and limitations:

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power control logic, coupled to said utilization assessment logic, for comparing said current total power consumption value with a threshold power value included in a specified power profile, wherein said specified power profile is selected from a plurality of power profiles stored within said power control logic.

Applicant respectfully asserts that Mittal does not teach storage of a plurality of power profiles within power control logic, nor does he teach selection of a power profile from among the plurality. Mittal teaches a mechanism for sustaining performance while managing worst-case power consumption. Furthermore, Mittal does not teach any other aspect of profiling or trading off performance for power. Mittal is entirely silent with regard to storage of multiple power profiles and selection therefrom for power management purposes. Moreover, Mittal does not suggest that his invention can be applied in any application other than worst-case power consumption management.

Consequently, Applicant respectfully requests that the rejection of claim 1 be withdrawn.

With respect to claims 2 and 6-8, these claims depend from claim 1 and add further limitations that are neither anticipated nor made obvious by Mittal. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejections of claims 2 and 6-8.

The Examiner also rejected claims 9 and 14 of the same basis as was set forth in the rejection of claim 1. Applicant notes that both claims 9 and 14 contain substantially similar limitations as claim 1 directed towards storage of a plurality of power profiles and selection of one therefrom, which has been argued above as being allowable over Mittal. Therefore, it is requested that the rejections of claims 9 and 14 be withdrawn as well.

With respect to claims 10-13, these claims depend from claim 9 and add further limitations that are neither anticipated nor made obvious by Mittal. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejections of claims 10-13.

With respect to claims 15-16 and 20-22, these claims depend from claim 14 and add further limitations that are neither anticipated nor made obvious by Mittal. Accordingly,

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Applicant respectfully requests that the Examiner withdraw the rejections of claims 15-16 and 20-22.

Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claims 2-6 and 17-19 under 35 U.S.C. 103(a) as being unpatentable over Mittal. Applicant respectfully traverses the Examiner's rejections.

In that Applicant has argued above that Mittal does not teach storage of a plurality of power profiles and selection therefrom for purposes of managing the activity of a plurality of functional units, it is asserted that any additional limitations to the invention does not render the claims obvious in view of Mittal. Consequently, Applicant requests that the rejections of claims 2-6 and 17-19 be withdrawn as well.

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CONCLUSIONS

In view of the arguments advance above, Applicant respectfully submits that claims 1-22 are in condition for allowance. Reconsideration of the rejections is requested, and allowance of the claims is solicited.

Applicant earnestly requests that the Examiner contact the undersigned practitioner by telephone if the Examiner has any questions or suggestions concerning this amendment, the application, or allowance of any claims thereof.

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| I hereby certify under 37 CFR 1.8 that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office on the date of signature shown below. |
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Respectfully submitted,
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